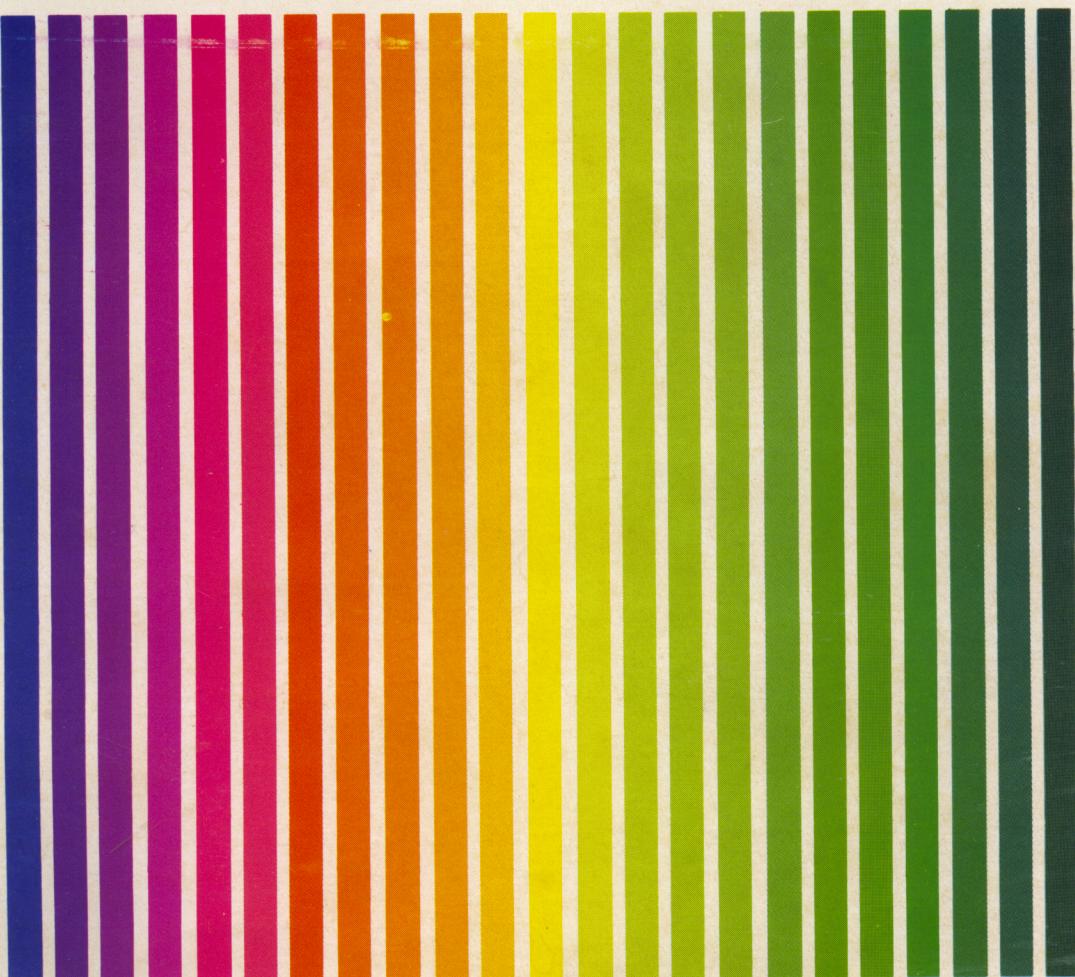




ATARI® PROGRAM EXCHANGE



Richard Lindgren

REAL ESTATE CASH FLOW ANALYSIS

Evaluate property investments

Diskette: 32K (APX-20169)

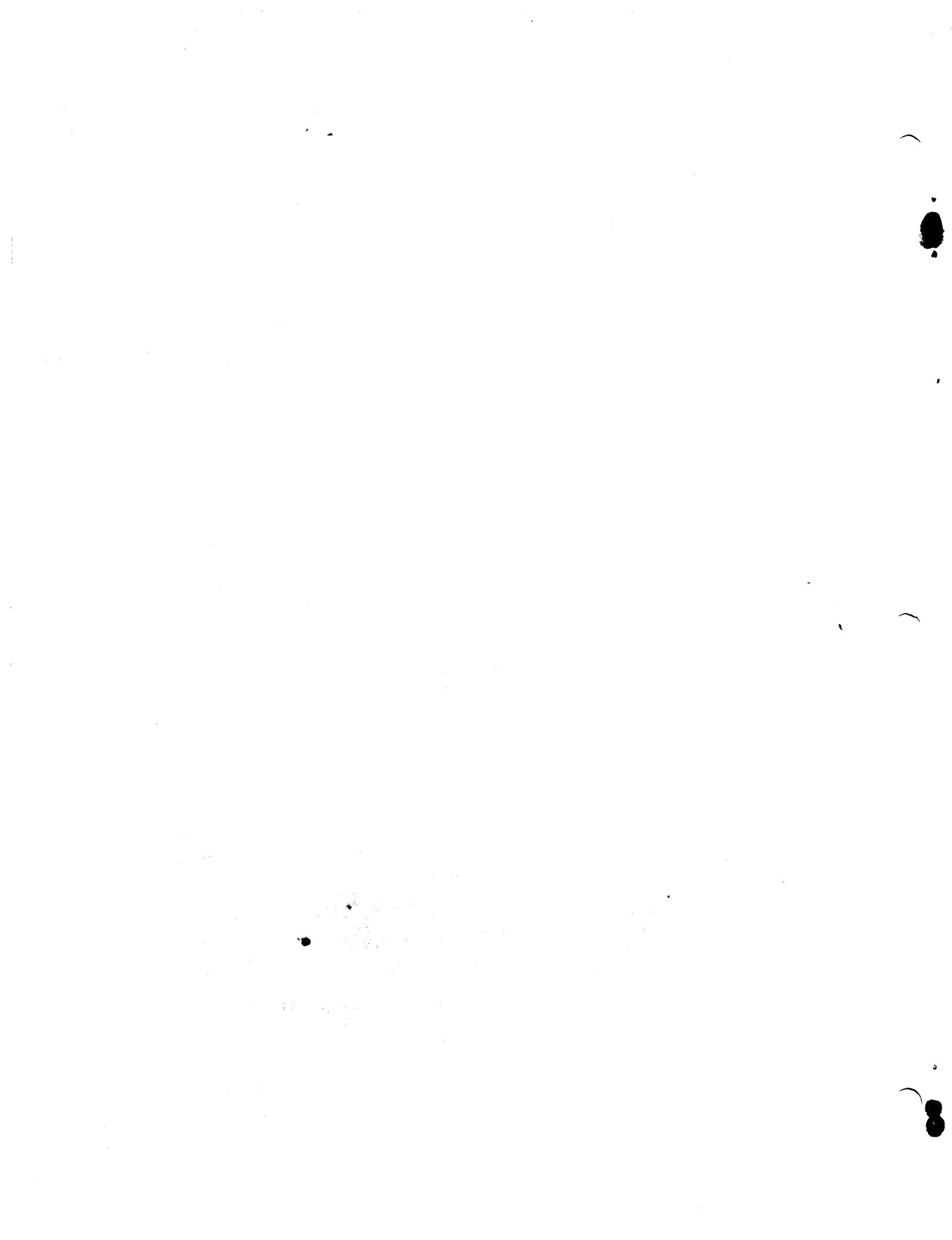
User-Written Software for ATARI Home Computers

Richard Lindgren

REAL ESTATE CASH FLOW ANALYSIS

Evaluate property investments

Diskette: 32K (APX-20169)



REAL ESTATE CASH FLOW ANALYSIS

by

Richard K. Lindgren

Program and Manual Contents©1982 Richard K. Lindgren

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INTRODUCTION

OVERVIEW

REAL ESTATE CASH FLOW ANALYSIS is a three-part program to help novice and professional investors in analyzing the costs and benefits of income-producing property. The parts are

1. DATA EDITOR - helps compile, document, and modify the relevant analysis data.
2. CASH FLOW ANALYSIS - computes before-tax and after-tax cash flows, profitability measures, and projected net worth for an investment property.
3. LOAN AMORTIZATION - prints a mortgage amortization schedule for projecting principal and interest payments.

The diskette also contains the data file "SAMPLE" to help illustrate the programs.

Many different types of people successfully invest in real estate without extensive financial expertise. The mathematics of real estate investment are not particularly complex, and you don't have to be a financial wizard to use these programs or understand the results. An investor is mainly concerned with the cash generated and required, the tax consequences, and the relative worth of the property as compared with other investments. These computations can be tedious and time-consuming, though, especially when projecting several years into the future. Fortunately, tedious computations are what a computer does best. A personal computer can help you with your investment decisions by providing "decision support". That is, the computer can relieve you of the tedium of the mathematical calculations, and it can organize the information required for you to reach your decision.

Real estate analysis also requires a lot of numeric information to carry out the computations; an investor can only guess at some of these figures. A decision support program helps you organize and document the data, and easily change the "fuzzy" numbers to explore the effect of changes. Without this type of support, it's easy to get confused in an analysis, forgetting which assumptions were made to generate a particular analysis.

The objective of this package is to support an investor's organizational and computational needs, freeing him or her to explore the "what if" questions that abound in real estate. What if interest rates change? What if my vacancy rate goes up? What if I have to pay an extra 10 percent for the property? You can easily explore all of these questions and more with REAL ESTATE CASH FLOW ANALYSIS.

REQUIRED ACCESSORIES

32K RAM
ATARI 810 Disk Drive
ATARI BASIC Language Cartridge

OPTIONAL ACCESSORIES

ATARI 825 80-Column Printer

CONTACTING THE AUTHOR

Users wishing to contact the author about REAL ESTATE CASH FLOW ANALYSIS may write to him at:

315 Zion's Ridge
LeMone, Iowa 50140

SUGGESTED READING

IRS Publication 527, "Rental Property," contains helpful information on current tax issues involving real estate.

GETTING STARTED

LOADING THE PROGRAM INTO COMPUTER MEMORY

1. Insert the ATARI BASIC Language Cartridge into the cartridge slot of your computer console.
2. If you plan to use a printer, turn it, and the ATARI 850 Interface Module, on.
3. Have your computer turned off.
4. Turn on your disk drive.
5. When the BUSY light goes out, open the disk drive door and insert the REAL ESTATE CASH FLOW ANALYSIS diskette with the label in the lower right-hand corner nearest to you. (Use disk drive one if you have more than one drive.)
6. Turn on your computer and your TV set. While the program automatically loads into computer memory, it displays a "loading" message, followed by the main menu.
7. When the main menu displays, you should remove the program diskette from the disk drive and insert another DOS-II formatted diskette if you wish to save your data.

ENTERING DATA

Throughout REAL ESTATE CASH FLOW ANALYSIS, you enter data and select options by responding to prompted questions. In many cases, you need enter only the information, without having to press the RETURN key. However, in some instances, pressing the RETURN key is necessary to signal to the program that you've completed entering your data. If the program doesn't process your response immediately, then press the RETURN key.

THE MAIN MENU

A typical session with this package involves moving back and forth from one part to another. Alternative loan arrangements are calculated using LOAN AMORTIZATION. This information and other factors are fed into DATA EDITOR to create and document one or more trial data sets, which are in turn fed into CASH FLOW ANALYSIS for analysis. One analysis might suggest a change to one or more of the factors, which necessitates switching back to one of the other programs.

To facilitate this iterative process, each part's menu gives you immediate access to the other two parts of the program. The following main menu displays only upon loading the program into computer memory:

REAL ESTATE CASH FLOW
ANALYSIS PROGRAM
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1: REAL ESTATE DATA EDITOR

2: CASH FLOW ANALYSIS

3: LOAN AMORTIZATION &
PAYMENT COMPUTATION

ENTER OPTION (1-3)?

Type the number next to the option to select one of the program
sections. Instructions for using each part follow.

USING DATA EDITOR

PURPOSE

You use DATA EDITOR to create data files containing information used by CASH FLOW ANALYSIS. You can either create one file per property and modify it using this program, or create several files, each containing slightly different data on the same property.

Press 1 (REAL ESTATE DATA EDITOR) on the main menu to begin your work in DATA EDITOR. You can also reach it from menus in the other program sections.

DATA EDITOR MENUS

The DATA EDITOR contains three menus: (1) an Investor Edit menu, (2) a Property Edit menu, and (3) a Mortgage Edit menu.

Investor Edit menu

The Investor Edit menu looks like this:

REAL ESTATE DATA EDITOR

A. DATA FILE NAME?
B. DESCRIPT.?
C. OPPORTUNITY COST (%) 0
D. WORKING CAP. LOAN RATE (%) 0
E. PERSONAL TAX RATE (%) 0
F. HOW MANY MORTGAGES (0-4)? 1

1. PROPERTY EDIT MENU
2. MORTGAGE EDIT MENU #1

4. LOAD DATA
5. PRINT DATA
6. SAVE DATA
7. ANALYZE CASH FLOW
8. AMORTIZE LOAN

CHOOSE OPTIONS A-F TO CHANGE
A DATA ITEM, NUMBERED LINES
TO GET A DIFFERENT MENU

WHICH OPTION?

Figure 1. Investor Edit Menu

You use the Investor Edit menu to enter general values and information relevant to investments. You need to enter data items A through F to perform the Cash Flow Analysis. Except for item F, the values are initially set to zero. To change a data item, enter the appropriate letter in response to the WHICH OPTION? prompt at the bottom of the screen. The program then redisplays the item name in the prompt area and asks you to type in the value. You can enter data items in any order. The individual items are discussed at the end of this section.

You can go to the other two menus, Property Edit and Mortgage Edit, by pressing 1 or 2.

You also select the options at the bottom of the screen by typing the number next to the desired option and entering any requested information. LOAD DATA causes the program to read in an existing data file that you specify from the diskette for modification. If you select this option before entering a DATA FILE NAME (item A), the program prompts you to enter the name of the file to be loaded. You can enter the file name with or without the disk number identifier; for example, you can request the file titled SAMPLE either as D1:SAMPLE or as SAMPLE. If you don't use the identifier, the file is assumed to be on disk drive 1.

PRINT DATA lists the current information on the printer in the same format as it is displayed. SAVE DATA saves the current information in the diskette file designated by the DATA FILE NAME.

ANALYZE CASH FLOW takes you to the Cash Flow Analysis menu, and AMORTIZE LOAN takes you to the Loan Amortization menu.

Property Edit menu

You use the Property Edit menu, shown in Figure 2 below, to enter information related to the individual property you want analyzed. From this menu you can also return to the Investor Edit menu or go on to the first Mortgage Edit menu.

REAL ESTATE DATA EDITOR

A. PROPERTY COST	0
B. DOWN PAYMENT	0
C. PERCENT DEPRECIABLE(%)	0
D. DEPRECIATION METHOD TYPE (1 OR 2)	0
E. DEPRECIABLE LIFE	0
F. ANNUAL GROSS RENT	0
G. VACANCY RATE(%)	0
H. RENT GROWTH RATE(%)	0
I. ANNUAL EXPENSES	0
J. EXPENSE GROWTH RATE(%)	0
K. ANNUAL R.E. TAXES	0
L. R.E. TAX GROWTH RATE(%)	0
M. PROP. VALUE GROWTH RATE(%)	0

- 2. MORTGAGE EDIT MENU #1
- 3. INVESTOR EDIT MENU

- 5. PRINT DATA
- 6. SAVE DATA
- 7. ANALYZE CASH FLOW
- 8. AMORTIZE LOAN

WHICH OPTION?

Figure 2. Property Edit Menu

Mortgage Edit Menu

There may be up to four mortgages for a single property. You specify the number of mortgages in the Investor Edit menu. Each mortgage menu is similar to the first, shown in Figure 3 below. If you have more than one mortgage, an option displays (for example, 2. MORTGAGE EDIT MENU #2), allowing you to select the next mortgage.

REAL ESTATE DATA EDITOR

- | | |
|--------------------------|---|
| A. MORTGAGE PRINCIPAL #1 | 0 |
| B. MONTHLY PAYMENT | 0 |
| C. INTEREST RATE(%) | 0 |
| D. TERM (YEARS) | 0 |
| E. 1ST YEAR IN FORCE | 0 |

- 1. PROPERTY EDIT MENU
- 3. INVESTOR EDIT MENU

- 4. LOAD DATA
- 5. PRINT DATA
- 6. SAVE DATA
- 7. ANALYZE CASH FLOW
- 8. AMORTIZE LOAN
- 9. COMPUTE LOAN PAYMENT

WHICH OPTION?

Figure 3. Mortgage Edit Menu

Note there is an additional item on the bottom of this menu. You use COMPUTE LOAN PAYMENT to compute the monthly payment that will fully pay off the loan in the time specified. To use this option, you must first enter the MORTGAGE PRINCIPAL, INTEREST RATE, and the TERM. Then, when you select 9, the program computes the monthly payment and inserts that value opposite COMPUTE LOAN PAYMENT. You can do this and other loan computations also in the Loan

Amortization section, reached by selecting 8 , AMORTITIZE LOAN.

WHAT NUMBERS DO I USE?

Most of the following data items will be estimates. In fact, a major part of real estate analysis is to determine the "sensitivity" of a range of estimates. Where accurate numbers are available, though, you should use them as much as possible. Previous owners, tenants, other investors, and a lot of reading will help narrow the range.

REAL ESTATE CASH FLOW ANALYSIS is designed for trying out several variations of the same data item as input to your analysis. You may want initially to create three data sets. Start out with your "best guess" and save it on the diskette. Then change the DATA FILE NAME and DESCRIPTION, and modify the estimates you are least sure about to create a "worst case" set. Assume, for instance, that inflation is higher than expected. This will change the growth rates especially. Save this data set and create an "optimistic case" set in the same manner. When you run CASH FLOW ANALYSIS using these sets, the critical assumptions for your investment will become more evident. You can then come back to this section to modify the critical items and repeat the analysis.

DATA ITEM EXPLANATIONS

DATA FILE NAME

Enter the name of the diskette data file from which the data will be loaded or to which the data will be saved. The name may have a three-letter extension code, if desired. You don't have to save a data set to analyze it. You can switch back and forth between the program sections without affecting the data set as long as you don't load in another data file.

DESCRIPTION

Enter a description up to 25 characters describing this property or set of data.

OPPORTUNITY COST

Enter the percent return (after tax) that could be earned by investing an equal amount of funds in another investment of similar risk. You use opportunity cost to determine the value of this investment relative to alternative opportunities. Another way to set this item is to enter your "target" rate of return for this property, the rate you would like to earn.

WORKING CAPITAL LOAN RATE

Enter the interest rate you would have to pay to borrow funds on a short-term basis. Any cash shortage in operating funds is assumed, by CASH FLOW ANALYSIS, to be borrowed at this rate to keep track of the total amount invested. You can set this rate to zero if

desired.

PERSONAL TAX RATE

Enter your marginal income tax rate (the rate paid on any additional income). This amount can be found by referring to Tax Rate Schedule X, Y, or Z in the current year's Form 1040 Instructions. These schedules show the dollar amount of taxes due for a given income plus a percentage that must be applied to any excess income. This excess percentage at your income level is the marginal tax rate.

HOW MANY MORTGAGES?

Enter the number of mortgages (from 0 to 4) you will use to finance this property.

PROPERTY COST

Enter the total purchase price of the property.

DOWN PAYMENT

Enter the cash or cash-equivalent down payment required for the purchase of the property.

PERCENT DEPRECIABLE

Enter the percentage of the purchase price that can be depreciated for tax purposes. This is usually the percentage value of the building itself. The land value is not depreciable.

DEPRECIATION METHOD TYPE

Enter 1 if you'll depreciate this property on a straight line basis, or 2 if you'll use the Accelerated Cost Recovery System (ACRS method). The second option gives the largest allowable depreciation expense in the early years of the property's life, in exchange for lower deductions in later years.

DEPRECIABLE LIFE

This is the length of time over which you wish to depreciate the property. This must be 15 years for the ACRS method and can be 15, 35, or 45 years for the straight-line method.

ANNUAL GROSS RENT

Enter the expected rental revenues in the first year, assuming 100 percent occupancy.

VACANCY RATE

Enter the percentage of the rent expected to be lost per year due to vacancies.

RENT GROWTH RATE

Enter the percentage increase per year in rent that you expect to attain.

ANNUAL EXPENSES

Enter the cash maintenance and operating expenses (other than real estate taxes) expected in the first year.

EXPENSE GROWTH RATE

Enter the rate at which you expect the above expenses to grow over the life of the property.

ANNUAL R. E. TAXES

Enter the expected real estate taxes for the first year.

R. E. TAX GROWTH RATE

Enter the rate at which you expect the property taxes to grow over the life of the property.

PROPERTY VALUE GROWTH RATE

Enter the rate at which you expect the market value of the property to grow.

MORTGAGE PRINCIPAL

For each loan, enter the beginning loan balance.

MONTHLY PAYMENT

Enter monthly payment for the loan. You can use either menu item 9, Compute Loan Payment, or the LOAN AMORTIZATION section to compute this value.

INTEREST RATE

Enter the annual interest rate for the loan.

TERM

Enter the length of the loan in years.

1ST YEAR IN FORCE

Enter the year the loan becomes effective. This can be used, for example, to have mortgage #1, with a term of three years, be replaced in year four by mortgage #2. This value should be 1 for loans used in the initial purchase.

SAMPLE DATA

At the end of this section is a set of sample data that will be used to illustrate CASH FLOW ANALYSIS. The listing was obtained by selecting the PRINT DATA option. The description of this data set is SAMPLE ANALYSIS #1, and it is saved in the diskette file "SAMPLE".

Notice there are two mortgages for this data set, the first in the amount of \$75,000, lasting for only three years. As the payments are not sufficient to pay off the principal in the three-year term, this indicates that a balloon payment for the balance must be paid at the end of the third year. This will be funded by the second mortgage, with an initial principal of \$71,000 and a 25-year term. A monthly payment of \$854.67 is required to fully amortize this second loan in 25 years. LOAN AMORTIZATION was used to calculate the pay-off requirement of the first loan and the monthly payment for the second.

DATA FILE NAME: SAMPLE

SAMPLE ANALYSIS #1

OPPORTUNITY COST(%)	12
WORKING CAPITAL LOAN RATE(%)	15
PERSONAL TAX RATE(%)	30
HOW MANY MORTGAGES(0-4)	2

PROPERTY COST	100000
DOWN PAYMENT	25000
PERCENT DEPRECIABLE(%)	90
DEPRECIATION METHOD(1 OR 2)	2
DEPRECIABLE LIFE	15
ANNUAL GROSS RENT	12000
VACANCY RATE(%)	4
RENT GROWTH RATE(%)	6
ANNUAL EXPENSES	1000
EXPENSE GROWTH RATE(%)	8
ANNUAL R.E. TAXES	1500
R.E. TAX GROWTH RATE(%)	5
PROP. VALUE GROWTH RATE(%)	10

MORTGAGE #1 PRINCIPAL	75000
MONTHLY PAYMENT	850
INTEREST RATE(%)	12
TERM (YEARS)	3
1ST YEAR IN FORCE	1

MORTGAGE #2 PRINCIPAL	71000
MONTHLY PAYMENT	854.67
INTEREST RATE(%)	14
TERM (YEARS)	25
1ST YEAR IN FORCE	4

USING CASH FLOW ANALYSIS

PURPOSE

You use CASH FLOW ANALYSIS to analyze the cash flow, income, and capital gains from a real estate investment. Using it, for example, you can make assumptions regarding expenses, inflation, and tax effects to determine the maximum price to pay for an individual property. Other uses include analyzing returns on one property relative to another, and keeping track of the profitability of an existing investment.

A common real estate investment strategy is to attain a positive flow of cash from rentals while at the same time creating a tax loss which can be used to lower the taxes due on other income. This is possible because the property can be depreciated even though it often increases in value. Depreciation is a tax-deductible expense, but does not require the payment of cash as do other expenses like maintenance costs and property taxes. Also, if the property value increases over time, any profit from later selling the property is taxed at the lower, capital gains tax rate.

PROGRAM OPERATION

You create the information required to perform a cash flow analysis by using DATA EDITOR or loading it from a stored file. The sample data presented in the DATA EDITOR section of this manual will be used to illustrate how CASH FLOW ANALYSIS works and to explain the results.

You reach this section by selecting the option CASH FLOW ANALYSIS on the main menu, or by selecting the ANALYZE CASH FLOW item from a menu in one of the other sections. If you haven't yet created a data set in the DATA EDITOR, the program prompts you to ENTER DATA FILE NAME. Enter the name of a file previously saved that contains the desired analysis data. You can indicate a file on disk drive 1 by simply typing its name. For a file residing on any other disk, precede the file name with the appropriate disk number, for example, D2:SAMPLE. The program will read the file contents and display the menu below:

REAL ESTATE CASH FLOW ANALYSIS

- 1 - CASH FLOW PROJECTION
- 2 - NET WORTH ANALYSIS
- 3 - PROFITABILITY RATIOS
- 4 - ALL OF THESE
- 5 - NEW DATA FILE
- 6 - EDIT DATA
- 7 - AMORTIZE LOAN

ENTER OPTION (1-7)?

At this point, you can select one or all of the three analyses, or read in a different data file. Options 6 and 7 let you go to the other program sections to modify the data. If you select one of the analysis options, the program gives you the option of listing the results on the screen or to the printer. You are then requested to enter the years you wish to analyze. The screen option allows you to see only one year at a time; however, you can list as many as five years of analysis at one time on the printer.

After specifying the years, the program begins the computations requested. The results for all three analyses for the first five years are shown on the following page. The CASH FLOW PROJECTION (option 1) consists of the lines through TAX SVGS. ON OTHER INCOME. The NET WORTH ANALYSIS (option 2) continues through the line TOTAL TAX ON SALE. The remaining lines are the PROFITABILITY RATIOS (option 3). The values are all rounded to the nearest dollar or one-hundredth of a percent.

SAMPLE ANALYSIS #1

SOURCE FILE: SAMPLE

	1	2	3	4	5
GROSS RENT.....	12000	12720	13483	14292	15150
less VACANCY ALLOWANCE...	480	509	539	572	606
EFFECTIVE GROSS INCOME...	11520	12211	12944	13721	14544
less R.E. TAXES.....	1500	1575	1654	1736	1823
less EXPENSES.....	1000	1080	1166	1260	1360
NET RENTAL INCOME.....	9020	9556	10124	10724	11360
less DEPRECIATION.....	10800	9000	8100	7200	6300
less INTEREST.....	8932	8771	8590	9919	9869
TAXABLE INCOME.....	-10712	-8215	-6566	-6395	-4809
plus DEPRECIATION.....	10800	9000	8100	7200	6300
less PRINCIPAL PAYMENTS..	1268	1429	1303	337	387
CASH THROW-OFF.....	-1180	-644	231	468	1104
less INCOME TAXES.....	0	0	0	0	0
CASH FROM OPERATIONS....	-1180	-644	231	468	1104
WORKING CAP. LOAN BALANCE.	1180	2001	2070	1912	1094
SPENDABLE CASH AFT. TAXES	0	0	0	0	0
TAX SVGS. ON OTHER INCOME	3214	2464	1970	1918	1443
YEAR-END MARKET VALUE....	110000	121000	133100	146410	161051
BALANCE OF LOANS.....	74912	74303	73070	72574	71370
NET WORTH OF PROPERTY....	35088	46697	60030	73836	89681
CAPITAL GAIN (IF SOLD)...	20800	40800	61000	81510	102451
CAPITAL GAINS TAX.....	1560	3600	5772	8089	10566
INC. TAX ON EXCESS DEPR..	2340	3240	3870	4230	4320
TOTAL TAX ON SALE.....	3900	6840	9642	12319	14886
% EQUITY PAYBACK AFT TAX.	12.85	22.71	30.59	38.26	44.03
% NET RENT TO MKT VALUE..	8.2	7.9	7.61	7.32	7.05
RETURN ON NET WTH BEF TAX	35.63	31.25	29.05	23.78	22.96
RETURN ON NET WTH AFT TAX	37.61	35.7	31.37	25.89	23.93
CASH RETURN/EQUITY B. TAX	-4.72	-2.58	0.93	1.87	4.42
CASH RETURN/EQUITY A. TAX	12.85	9.86	7.88	7.67	5.77
DEFAULT RATIO.....	1.06	1.1	1.09	1.07	1.01
NET PRESENT VALUE.....	5716	11607	17101	21550	25714
RETURN ON EQUITY (IRR)...	37.61	36.69	35.02	32.87	31.21

ITEM DESCRIPTIONS

Each analysis item is explained below. The lowercase items in quotation marks refer to items from the data file as described in the DATA EDITOR instructions. The analysis assumes, for tax purposes, that the property is purchased on January 1 of the first year. All computed items printed will be amounts spent during the year indicated, or will be end-of-year values, depending on the nature of the item. Parentheses indicate the order in which the computation is made, with operations inside the parentheses performed first.

CASH FLOW PROJECTION

GROSS RENT

Initially set to "annual gross rent," this item grows annually at the rate established by "rent growth rate."

VACANCY ALLOWANCE

This is GROSS RENT times "vacancy rate."

EFFECTIVE GROSS INCOME

This is GROSS RENT minus VACANCY ALLOWANCE.

REAL ESTATE TAXES

Initially set to "annual r.e. taxes," this item grows at the rate established by "r.e. tax growth rate."

EXPENSES

Initially set to "annual expenses," this item grows at the rate established by "expense growth rate."

NET RENTAL INCOME

This is EFFECTIVE GROSS INCOME minus REAL ESTATE TAXES minus EXPENSES. It's the current income generated by the property excluding tax and financing considerations.

DEPRECIATION

This is a function of "property cost", "percent depreciable", and "depreciable life." It's calculated either by the straight-line or ACRS methods, depending on "depreciation method." The straight-line method takes 1/15th of the depreciable cost each year of a 15-year life, the minimum life allowed for tax purposes, 1/35th per year for a thirty-five-year life, etc. The "Half-year Rule" used by the IRS states, however, that only one-half of the straight-line depreciation on real estate may be taken in the first year, even if the property is

purchased on January 1. The table for computing depreciation using the ACRS (Accelerated Cost Recovery System) method is shown at the end of this section.

INTEREST

This is calculated from the outstanding mortgage balances times their associated interest rates. The interest is computed monthly and summed for the year. This amount does not include any working capital loan interest, which is assumed to be "rolled over" into the working capital loan balance.

TAXABLE INCOME

This is the amount of current income subject to tax. This item equals NET RENTAL INCOME minus DEPRECIATION minus INTEREST.

DEPRECIATION

The same amount calculated before, this item is added back to get cash flow because it isn't a cash expense.

PRINCIPAL PAYMENTS

This is the additional cash required to pay off the mortgage principal. This item is simply the sum of the monthly mortgage payments minus INTEREST.

CASH THROW-OFF

This is the cash generated by the investment before income taxes. This item is equal to TAXABLE INCOME plus DEPRECIATION minus PRINCIPAL PAYMENTS. A negative value indicates that more cash must be invested to keep the project solvent.

INCOME TAXES

This is TAXABLE INCOME times "personal tax rate." Negative values are not shown in this line.

CASH FROM OPERATIONS

This is CASH THROW-OFF minus INCOME TAXES.

WORKING CAP. LOAN BALANCE

This is the accumulation of any negative balance from the line above. It is assumed that this cash shortage is "borrowed" either from a bank or other investments. This amount is reduced by any subsequent positive value in CASH FROM OPERATIONS. The annual interest specified by "working capital loan rate" is added onto the balance.

SPENDABLE CASH AFTER TAXES

This is the amount of CASH FROM OPERATIONS left over after paying off any WORKING CAPITAL LOAN BALANCE.

TAX SAVINGS ON OTHER INCOME

This is any negative result from the INCOME TAXES computation. It's the amount that taxes on any other income will be reduced due to this investment. Although indirect, it's nonetheless equivalent to a cash inflow if there is sufficient other income subject to tax.

NET WORTH ANALYSIS

YEAR-END MARKET VALUE

This is the "property cost" increased the first year and every year thereafter by "property value growth rate."

BALANCE OF LOANS

This is the sum of the outstanding loan balances plus WORKING CAPITAL LOAN BALANCE. The principal amounts for mortgages not yet in force are not included.

NET WORTH OF PROPERTY

This is YEAR-END MARKET VALUE minus BALANCE OF LOANS. It's an estimate of the before-tax cash that will be realized by selling the property at the end of the year.

CAPITAL GAIN (IF SOLD)

This is YEAR-END MARKET VALUE minus PROPERTY COST minus the accumulated DEPRECIATION amounts to date. It's the portion of the sale price that's subject to tax.

CAPITAL GAINS TAX

This is the tax due if sold (assessed at 40% of "personal tax rate") on what the CAPITAL GAIN would have been if the straight-line depreciation method were used ("depreciation method" #1).

INCOME TAX ON EXCESS DEPRECIATION

This is the tax due if sold (assessed at the "personal tax rate") on the difference between accumulated DEPRECIATION to date and the depreciation that would have been taken had the straight-line method been used. If the "depreciation method" is "1", this amount will be zero. This excess depreciation is taxed at the full personal tax rate to prevent benefiting from accelerated depreciation if you sell the property soon after purchase.

TOTAL TAX ON SALE

This is CAPITAL GAINS TAX plus INCOME TAX ON EXCESS DEPRECIATION.

PROFITABILITY RATIOS

PERCENT OF EQUITY PAYBACK AFTER TAX

This is a payback ratio measuring how much of the down payment has been returned as after-tax cash to date. The cash flows are not corrected on a present value basis. This is calculated as (CUMULATIVE SPENDABLE CASH AFTER TAXES plus CUMULATIVE TAX SAVINGS ON OTHER INCOME) divided by "down payment". A value of 100% indicates that all of the down payment has been recovered in cash and tax benefits since the purchase of the property.

PERCENT NET RENT TO MARKET VALUE

This is a measure of how the rental income is keeping up with the property's market value, computed as NET RENTAL INCOME divided by YEAR-END MARKET VALUE.

RETURN ON NET WORTH BEFORE TAXES

This indicates the current period earning power of the project irrespective of the tax situation of the owner. It also shows the expected return for staying in the project for one additional year. It's computed as (CASH THROW-OFF plus the change in NET WORTH OF PROPERTY from the prior year) divided by the prior year's NET WORTH OF PROPERTY. The prior year's NET WORTH in year 1 is the "down payment."

RETURN ON NET WORTH AFTER TAXES

This measures the after-tax percentage return earned by staying in the project one additional year. Since the after-tax benefits are dependent on selling the property, this is computed by comparing the after-tax benefits realized by selling the project this year as compared with selling it in the previous year. It is computed as (SPENDABLE CASH AFTER TAXES plus TAX SAVINGS ON OTHER INCOME plus the change in NET WORTH OF PROPERTY minus the previous year's TOTAL TAX ON SALE).

CASH RETURN ON EQUITY BEFORE TAX

This is the before-tax cash return in this period as a percentage of the original cash equity. This is computed as CASH THROW-OFF divided by "down payment."

CASH RETURN ON EQUITY AFTER TAX

This is the after-tax cash return in this period as a percentage of the original cash equity. It's computed as (SPENDABLE CASH AFTER

TAXES plus TAX SAVINGS ON OTHER INCOME) divided by "down payment."

DEFAULT RATIO

This is a measure of the property's current income breakeven point. Numbers over "1" indicate the property cannot break even, because the cash outlay exceeds the potential gross income. Numbers under "1" indicate the property is operating in the black. This is computed as (EXPENSES plus R.E. TAXES plus all "monthly payments" plus any outstanding WORKING CAPITAL LOAN BALANCE from the prior year) divided by GROSS RENT.

NET PRESENT VALUE

This is a measure of how much better off you will be in today's dollars by investing in the project instead of an alternative investment which earns returns equal to the specified "opportunity cost." It's calculated by taking each year's (SPENDABLE CASH AFTER TAXES plus TAX SAVINGS ON OTHER INCOME) and "discounting" it by dividing by $(1 + \text{"opportunity cost"})$ taken to the "nth" power, where "n" is the number of years from the property purchase. (NET WORTH OF PROPERTY minus TOTAL TAX ON SALE) for the current year is also discounted and added to the sum of the discounted cash and tax savings to date. "Down payment," which is the original cash investment, is subtracted. A positive amount indicates that you are better off by purchasing this property. A negative value indicates that the alternative investment is superior. The major advantage of this measure is that it equalizes varying cash flows in future years by stating them at their "present value."

RETURN ON EQUITY (IRR)

This is the "Internal Rate of Return" on the project. It's the rate that the "opportunity cost" would have to be for the project to have a NET PRESENT VALUE of zero in a given year. A NET PRESENT VALUE of zero indicates you're indifferent between this project and the alternative investment whose return is the "opportunity cost." Thus, if you can earn more than the RETURN ON EQUITY after taxes from another investment of equal or lower risk, the project at hand is an inferior one. Conversely, if you cannot earn this return elsewhere, the project is a good one (assuming your revenue and expense estimations are correct).

ANALYZING THE RESULTS

This program leaves the task of interpreting the results largely up to you. A few notes regarding the sample analysis may help to enlarge your understanding of the results, though. Use the results reproduced in this section and the input listing from the DATA EDITOR section to follow this discussion.

Remember that "garbage in = garbage out" is especially applicable here.

Your results will be no better than the quality of your data. You may want to hand-check a sample of the calculations, more as an exercise to review your assumptions and to familiarize yourself with the technique, than to convince yourself that the computer can add and subtract.

Sample investment data

This sample investment is a duplex costing \$100,000. We will put 25% down and initially finance the rest with a 12% land contract. This contract requires a balloon payment for the unpaid balance after 3 years. At that time, we hope to replace it with a 14% conventional, self-amortizing mortgage. We have the opportunity to earn 12% on other equal-risk investments and are currently in the 30% marginal tax bracket.

We hope to be able to rent these two units for \$500 each per month, increase the rent by 6% annually, and lose only one month's rent from one unit each year to vacancy. The land has a value of 10% of the property cost, so we can depreciate only \$90,000 using the ACRS method. Expenses will be about \$1000 per year, growing at 8%, with property taxes of \$1500, growing at 5%. We expect the value of the property to grow at an annual rate of 10%.

Analysis

As is typical of real estate investments, we will have a negative taxable income for several years, due primarily to a high depreciation expense deduction. The depreciation does not require any cash outlay, so our cash outflow is not nearly as bad. In fact, it turns positive in year 3. It would be more desirable to have a positive CASH THROW-OFF from the first year, but this would require either higher rents or lower expenses, neither of which seems feasible in this case. The negative cash flow is offset by the reduction in income taxes on other income of over \$3000 in the first year. This is as good as a cash inflow if we are currently paying that much in taxes.

The PRINCIPAL PAYMENTS are the differences between the annual interest payments and the sum of the monthly mortgage payments. In year 3 this is reduced by the \$308 difference between the balloon payment required to pay off mortgage #1 and the amount borrowed on mortgage #2.

The largest benefit of this project, which is again typical, is the large capital gain created by an increase in the property value. The favorable capital gains tax rate allows us to keep most of this gain if we sell, although there is a hefty tax at the normal rate on the faster depreciation allowed under the ACRS method.

The PERCENT OF EQUITY PAYBACK AFTER TAX indicates that by year 5 we will have recovered only 44% of our \$25,000 down payment in cash and tax benefits. Because our expenses and property value are growing faster than our rents, PERCENT OF NET RENT is declining, a possible

danger signal. The two RETURN ON NET WORTH measures indicate that it is profitable to hold on to this property for its cash flow benefits, although that advantage declines significantly in the first 5 years. This occurs because the NET WORTH grows faster than the benefits. The CASH RETURN measures are definitely unfavorable; the project is depending on capital gain, not current cash flow, to make it worthwhile.

The DEFAULT RATIO also indicates that the out-of-pocket cash outlay for this project continues to be unfavorable. A default ratio of .90 or lower is generally seen as preferable by lending institutions. The NET PRESENT VALUE indicates that a 5-year commitment to this project is preferable to the 12% alternative opportunity by the amount of over \$25,000. The RETURN ON EQUITY indicates that the alternative return would have to be well over 30% for us to be indifferent between the two.

The net picture for this investment suggests that this is a worthwhile project if our growth and expense assumptions are correct and if we have the additional cash to feed it for a couple of lean cash-flow years. If the property value growth does not come to pass, however, we could be in trouble. This is definitely a high risk/high return investment. We may want to explore several questions by modifying several of the assumptions. What if the interest on the loan in year 4 is 17%, causing the monthly payment to increase by \$166? These are the type of alternate analyses that can be easily investigated using CASH FLOW ANALYSIS, DATA EDITOR, and LOAN AMORTIZATION.

ERRORS

Aside from errors that the program flags if you try to answer a request with an invalid response, the program may quit during the computations, responding with "DATA ERROR". This is probably the result of a missing data item or a value which is out of range. The best way to correct the program is to review your input data from DATA EDITOR. Look for missing or questionable items and change them to more realistic values. Growth rates are especially suspect, because a large rate can cause a related item to "balloon" into an unreasonable figure.

ACCELERATED COST RECOVERY SYSTEM DEPRECIATION

The ACRS Method is an accelerated depreciation method that can be used for tax purposes on all property acquired after 1980. The old "declining balance" methods are no longer allowed. The values below are percentages of a property's "unadjusted basis" that can be defined as "property cost" multiplied by "percent depreciable."

This schedule is for the classification called "15-year property," which includes all real property except mobile homes. These are "ten-year property," a class currently not implemented in this program. There is also a different schedule for property that qualifies as a "low-income" housing project. This schedule is also not implemented.

SCHEDULE FOR 15-YEAR PROPERTY

YEAR	PERCENT
1	12%
2	10
3	9
4	8
5	7
6	6
7	6
8	6
9	6
10	5
11	5
12	5
13	5
14	5
15	5

COMPUTING LOAN PAYMENTS AND AMORTIZATIONS

PROGRAM OPERATION

You use this section to compute monthly payments, interest rates, principal amounts, and terms for self-amortizing loans (those in which a single monthly payment pays both the interest and principal over the term of the loan). Mortgage and automobile loans, for example, are usually self-amortizing. The program will also print a monthly amortization schedule showing the portion of each payment going to pay the interest and the portion which reduces the loan principal.

To use this section, select the LOAN AMORTIZATION option from the main menu, or use the AMORTIZE LOAN options on the menus in the other sections. You must then enter three items, as explained in the instructions the program displays:

LOAN AMORTIZATION

YOU MUST ENTER AT LEAST THREE OF THESE FOUR ITEMS, FOLLOWED BY RETURN:

- 1 - AMOUNT OF LOAN
- 2 - ANNUAL INTEREST
- 3 - NUMBER OF MONTHS
- 4 - MONTHLY PAYMENT

ENTER A ZERO FOR THE ITEM YOU WISH TO HAVE CALCULATED FOR YOU

AMOUNT OF LOAN?

The program then prompts you to enter each of these four values. After entering the fourth, the program computes any value for which you entered a zero. You may, if you wish, enter values for all four; the program will attempt to amortize the loan using those values.

Next, you have the following five options:

- 1 - PRINT AMORTIZATION ON SCREEN
- 2 - PRINT AMORTIZATION ON PRINTER
- 3 - REPEAT CALCULATION
- 4 - EDIT DATA
- 5 - ANALYZE CASH FLOWS

ENTER OPTION (1-5)?

If you select either of the first two options, the program requests that you enter a description of up to 40 characters. It then asks you to enter the year in which the first payment will be made. Next, you enter the

month of the first payment, January, for example, would be entered as a "1", June as a "6", and so on. Finally, you enter the number of months of amortization you wish to have printed. This can be anywhere from one to the number of months previously input or computed.

The amortization schedule then prints on the screen or printer as you selected. The schedule for the first loan in the "SAMPLE" data file, used in CASH FLOW ANALYSIS, is shown below. The starting month and year were input as the first month of 1983. Notice that the description and values input or computed are printed first. In this case, all four values were input, so there is an unpaid balance of \$70692.31 remaining after the three-year term. This would be the "balloon payment" due at that time. The interest paid is totaled for each year and over the whole term. If the first loan payment is in January, the annual interest shown will be the same as that used in CASH FLOW ANALYSIS.

In the "SAMPLE" analysis, a second mortgage was planned to come into effect at the beginning of the fourth year. The monthly payment was computed using this program by entering a loan amount of \$71,000 (the balloon payment rounded upward), an annual interest rate of 14%, and an expected loan term of 300 months (25 years). A zero was entered for "monthly payment," so the amount of \$854.67 was computed by the program as the payment that will amortize this loan over 25 years.

SAMPLE ANALYSIS MORTGAGE #1

AMOUNT OF LOAN = \$ 75000.00
ANNUAL INTEREST = 12.00%
NUMBER OF MONTHS = 36.00
MONTHLY PAYMENT = \$ 850.00

MONTH INTEREST PRINCIPAL BAL.DUE

FOR YEAR OF 1983

JAN	750.00	100.00	74900.00
FEB	749.00	101.00	74799.00
MAR	747.99	102.01	74696.99
APR	746.97	103.03	74593.96
MAY	745.94	104.06	74489.90
JUN	744.90	105.10	74384.80
JUL	743.85	106.15	74278.65
AUG	742.79	107.21	74171.43
SEP	741.71	108.29	74063.15
OCT	740.63	109.37	73953.78
NOV	739.54	110.46	73843.32
DEC	738.43	111.57	73731.75

INTEREST PAID IN 1983 = \$ 8931.75

FOR YEAR OF 1984

JAN	737.32	112.68	73619.07
FEB	736.19	113.81	73505.26
MAR	735.05	114.95	73390.31
APR	733.90	116.10	73274.21
MAY	732.74	117.26	73156.96
JUN	731.57	118.43	73038.53
JUL	730.39	119.61	72918.91
AUG	729.19	120.81	72798.10
SEP	727.98	122.02	72676.08
OCT	726.76	123.24	72552.84
NOV	725.53	124.47	72428.37
DEC	724.28	125.72	72302.65

INTEREST PAID IN 1984 = \$ 8770.90

FOR YEAR OF 1985

JAN	723.03	126.97	72175.68
FEB	721.76	128.24	72047.44
MAR	720.47	129.53	71917.91
APR	719.18	130.82	71787.09
MAY	717.87	132.13	71654.96
JUN	716.55	133.45	71521.51
JUL	715.22	134.78	71386.73
AUG	713.87	136.13	71250.59
SEP	712.51	137.49	71113.10
OCT	711.13	138.87	70974.23
NOV	709.74	140.26	70833.97
DEC	708.34	141.66	70692.31

INTEREST PAID IN 1985 = \$ 8589.66

TOTAL INTEREST PAID = \$ 26292.31

BALANCE DUE = \$ 70692.31

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instructions are meeting your needs. You are our best source for suggesting improvements! Please help us by taking a moment to fill in this review sheet. Fold the sheet in thirds and seal it so that the address on the bottom of the back becomes the envelope front. Thank you for helping us!

1. Name and APX number of program.

2. If you have problems using the program, please describe them here.

3. What do you especially like about this program?

4. What do you think the program's weaknesses are?

5. How can the catalog description be more accurate or comprehensive?

6. On a scale of 1 to 10, 1 being "poor" and 10 being "excellent", please rate the following aspects of this program:

- Easy to use
- User-oriented (e.g., menus, prompts, clear language)
- Enjoyable
- Self-instructive
- Useful (non-game programs)
- Imaginative graphics and sound

7. Describe any technical errors you found in the user instructions (please give page numbers).

8. What did you especially like about the user instructions?

9. What revisions or additions would improve these instructions?

10. On a scale of 1 to 10, 1 representing "poor" and 10 representing "excellent", how would you rate the user instructions and why?

11. Other comments about the program or user instructions:

From



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